

PATENT
Attorney Docket No.: JAG-00113

ORAL-CARE DEVICE AND SYSTEM

RELATED APPLICATIONS:

RC 5 This Application is a Continuation-in-part of the co-pending Application Serial No. 10/382,559, filed March 5, 2003, and titled "DENTITION CLEANING DEVICE AND SYSTEM," which is a continuation Application of the Application Serial No. 09/588,686, filed June 6, 2000, and titled "DENTITION CLEANING DEVICE AND SYSTEM," now U.S. Patent No. 6,571,417, which is a Continuation-in-part of the Application Serial No. 09/330,704 filed June 11, 1999, and titled "SQUEEGEE DEVICE AND SYSTEM", now U.S. Patent No. 6,319,332. The Application Serial No. 10/382,559, filed March 5, 2003, and titled "DENTITION CLEANING DEVICE AND SYSTEM," now U.S. Patent No. 6,571,417 and the Application Serial No. 09/330,704, filed June 11, 1999, and titled "SQUEEGEE DEVICE AND SYSTEM", now U.S. Patent No. 6,319,332, are all hereby incorporated by reference. This Patent Application also claims priority under 35 U.S.C. 119 (e) of the co-pending U.S. Provisional Patent Application Serial No. 60/439,317, filed January 10, 2003, and titled "TOOTHBRUSH" and the co-pending U.S. Provisional Patent Application Serial No. 60/463,347, filed March 15, 2003, and titled "SQUEEGEE TOOTHBRUSH." The U.S. Provisional Patent Application Serial No. 60/439,317 filed January 10, 2003, and titled "TOOTHBRUSH" and the U.S. Provisional Patent Application Serial No. 60/463,347, filed March 15, 2003, and titled "SQUEEGEE TOOTHBRUSH" are also both hereby incorporated by reference.

FIELD OF THE INVENTION:

25 This invention relates generally to cleaning and applicator devices. More specifically, this invention relates to cleaning and applicator devices with multiple regions configured to move independently.

the art that the present invention can equally be applied to devices that are configured to clean any number of different surfaces including, but not limited to, floors, cars, wafers and/or appliances.

5 In accordance with the present invention, a device comprises a cleaning head with two or more regions, wherein at least one of the regions preferably comprises a squeegee element configured to treat a working surface and at least one of the regions comprises bristles. In accordance with a preferred embodiment of the invention, at least one of the regions is configured to move independently of another of the regions. To move independently, herein, means that one of the regions is stationary while another region moves or that the regions move separately from one or
10 more of the other, but does not necessarily mean that the regions are not synchronized to move with a similar or the same motion or that the regions are not coupled to the same mechanism to drive the motion of the regions. Preferably, one or more of the regions are configured to vibrate, rotate, oscillate or otherwise automatically move relative to and independently from another of the regions. In accordance with further embodiments of the invention two or more of the regions
15 comprises bristle and squeegee elements. In still further embodiments of the invention, one or more of the regions of the cleaning head comprises nodules, i.e., resilient protrusions with any number of different geometries such as described below and further described in U.S. Patent Application No. 09/957,302, filed September 19, 2001, and titled "DEVICE WITH MULTI-
now U.S. Patent No. 6,865,767
STRUCTURAL CONTACT ELEMENTS," the contents of which are hereby incorporated by
20 reference.

pc
25 The squeegee elements utilized in the present invention can have any number of different geometries including curved, rounded angled, corrugated, pointed and/or textured walls and/or wiping edges. Squeegee elements can include squeegee segments with one or more terminus ends and/or squeegee segments that form matrices of squeegee compartments and continuous squeegee segments that encircle portions of regions. Squeegees utilized in the present invention can be formed from any number of different materials, but are preferably formed from a resilient

polymeric material such as silicon, latex, rubber, polyurethane or a combination thereof.
Preferably, squeegees, or a portion thereof, are formed from a material, or materials, that can be
molded and that result in squeegee elements with hardness values in a range of 10 to 100 Shores
A, as defined in the D2240-00 Standard Test Method for Rubber Property-Durometer Hardness,
5 published by the American Society for Testing Materials, the contents of which are hereby
incorporated by reference. Additional details of squeegee configurations are provided in the
U.S. Patent No. 6,319,332, titled "SQUEEGEE DEVICE AND SYSTEM," and U.S. Patent No.
6,571,417, titled "DENTITION CLEANING DEVICE AND SYSTEM," the contents of which
are also both hereby incorporated by reference.

10 Squeegees, in accordance with still further embodiments of the present invention, include an
abrasive material that is integrated with the material(s) used to form the squeegees and/or are
applied to surfaces of squeegee walls and/or edges after they are formed. Methods and materials
for making molded abrasive structures are described in U.S. Patent No. 6,126,533, and titled
15 "MOLDED ABRASIVE BRUSH", the contents of which are hereby incorporated by reference.

In accordance with a preferred embodiment of the invention, a squeegee element comprises an
elongated squeegee segments with smaller fins that protrude from walls of the elongated
squeegee segment and provide top wiping edges and side wiping edges, such as described in
20 detail in U.S. Patent Application No. 10/454,281, filed June 3, 2003, entitled "MULTI-
DIRECTIONAL WIPING ELEMENTS AND DEVICES USING THE SAME", the contents of
RC which are hereby incorporated by reference. ^{now U.S. Patent No. 6,859,969,}

25 In accordance with further embodiments of the invention, a system or device comprises a handle
which provides power to a motorized cleaning head comprising the regions, such as described
above. The cleaning head can be configured to detachably couple to the handle or, alternatively,
can be permanently attached to the handle. In accordance with further embodiments of the

PC "MULTI-DIRECTIONAL WIPING ELEMENTS AND DEVICES USING THE SAME,"
referenced previously.

Fig. 2 shows an electric powered oral-care apparatus 200 comprising a power cleaning head 201
5 with independently movable regions 203 and 205 such as described with reference to Figs. 1A-C
above and Figs. 3A-C below. In accordance with the embodiments of the invention, the electric
powered oral-care apparatus 200 comprises a power or recharging station 209 for docking a body
portion 211 of the oral-care apparatus 200. The power or recharging station 209 comprises
10 means 215 for plugging the power or recharging station 209 into an electrical receptacle and
recharging a battery (not shown) housed within the body portion 211 of the oral-care apparatus
200, wherein the battery is configured for providing power to a driver mechanism (not shown)
that moves one or both of the regions 203 and 205. Alternatively, or in addition to the power
supply mechanism described above, the apparatus 200 can be configured to be powered with
15 disposable batteries (not shown) that are housed in the body portion 211 of the oral-care
apparatus 200. Preferably, the oral-care apparatus 200 has a power switch 213 for energizing the
power head 201 to move the power cleaning head 201 on or turn it off. Also, the oral-care
apparatus 200 can include any number of timer mechanisms to indicate to a user a preferred
amount of time to clean teeth and gums with the oral-care apparatus 200. For example, the oral-
care apparatus 200 can be configured to automatically shut off in a predetermined period of time
20 after being energized with the power switch 213.

Figs. 3A-C show oral-care cleaning heads 300, 325 and 350 with movable regions comprising
squeegee elements, bristles, nodules and/or combinations thereof, in accordance with the
embodiments of the invention. Referring now to Fig. 3A, the oral-care cleaning head 300
25 comprises a base structure 301 for supporting a first region 305 and a second region 307. The
first region 305 comprises one or more squeegee elements 309 protruding therefrom. The
squeegee elements 309 are shown here as wave-like, wherein the squeegee elements 309 have

Referring now to Fig. 3C, the oral-care cleaning head 350 comprises a support structure 351 for supporting a first region 358 and a second region 359. The first region 358 comprises bristles 365 and/or nodules 366 protruding therefrom. The second region 359 comprises a squeegee element 352. The squeegee element 352 preferably comprises a continuous squeegee wall segment 357 that encircles a portion of the second region 359 and squeegee fins 353. The squeegee fins 353 protrude from an inner wall of the continuous squeegee wall segment 357. The squeegee fins 353 can protrude from the continuous squeegee wall segment 357 at any angle suitable for the application at hand and can protrude to the same or a different height from the support structure 351 than the top wiping edges of the continuous squeegee wall segment 357. Squeegee elements with squeegee fins are further described in U.S. Patent Application Serial No. 10/454,281, filed June 3, 2003, and titled "MULTI-DIRECTIONAL WIPING ELEMENTS AND DEVICES USING THE SAME", referenced previously. ^{now U.S. Patent No. 6,859,969,}

In operation, an oral-care cleaning solution, paste and/or gel is applied to the oral-care cleaning head 350 and the second region 359 rotates, oscillates, vibrates and/or otherwise moves independently of the first region 358 while cleaning teeth and/or gums. For example, the second region 359 can rotate or oscillate while the first region 358 moves in a back and forth motion and/or vibrates, such as described above with reference to Figs. 1A-C.

Still referring to Fig. 3C, the oral-care cleaning head 350 can also include a continuous squeegee element 355 that surrounds a portion of the first region 358. Preferably, the second region 359 of the oral cleaning head 350 further comprises one or more bristle tufts or nodules 367 that are surrounded by the continuous squeegee wall segment 357 and that are configured to move along with the squeegee element 352. While the oral-care cleaning heads 300, 325 and 350 have been described as having squeegee elements, bristle, nodules and combinations thereof, it will be clear to one skilled in the art that bristles are not required.

walls 701 and a top 702; Fig. 7B shows a nodule 710 with contoured walls 711 and a bow-tie shaped top 712; Fig. 7C shows a curved nodule 720 with protruding walls 721 (curved in the elongation direction) and a flat top 722; Fig. 7D shows a curved nodule 730 with protruding walls 731 (curved in the protruding direction) and a top 732; Fig. 7E shows a wedge shaped nodule 740 with tapered walls 743, triangular walls 741 and an edge 742; Fig. 7F shows a nodule 750 with grooved walls 753, bow-tie shaped walls 752 and a flat top 751; and Fig. 7G shows a nodule 760 with contoured walls 762 and a top 761. It will be clear to one skilled in the art that any number of symmetric and asymmetric nodule geometries and combinations thereof are useful in the contact device of the instant invention. Further descriptions of nodule structures and their applications are described in U.S. Patent Application No. 09/957,302, filed September 19, 2001 and titled "DEVICE WITH MULTI-STRUCTURAL CONTACT ELEMENTS", referenced previously. ^{now U.S. Patent No. 6,865,767,}

Fig 8 shows an oral-care cleaning head 800, in accordance with a preferred embodiment of the invention. The oral-care cleaning head 800 comprises a support structure 801 for supporting a first region 811 and a second region 803. The first region 811 comprises bristle tufts 809 for wiping the surfaces of gums and teeth. The second region 803 comprises a cup-shaped squeegee element 805 that includes a continuous squeegee segment encircling a portion of the second region 803 and squeegee fins protruding from an inner wall of the continuous squeegee segment. The continuous squeegee segment preferably encircles bristle tufts 807 that protrude from the second region for wiping surfaces of teeth and gums.

The first region 811 can be configured to remain stationary or move in any number of ways, as described above, while cleaning teeth and gums. Preferably the cup-shaped squeegee element 805 and the bristle tufts 807 of the second region 803 are configured to oscillate and/or rotate while cleaning teeth and/or gums. The oral-care cleaning head 800, described above is most